

Definition

The normal adult spleen lies immediately under the diaphragm in the left upper quadrant of the abdomen. It ranges in length from 6 to 13 cm and in weight from 75 to 120 g. The spleen is not normally palpable except in slender young adults. When the spleen can be felt below the left costal margin, at rest or on inspiration, splenic enlargement should be assumed and the explanation sought. Although the normal-size, or even the abnormally small, spleen can be involved in pathologic processes, with the exception of rubs associated with splenic infarcts, physical examination is generally not helpful in identifying the problem. Nevertheless, the enlarged and palpable spleen is an important clue to the presence of a variety of illnesses.

Technique

When examining the left upper quadrant of the abdomen, foremost in the examiner's mind should be the question of whether or not the spleen is enlarged. The examiner should *intend* to feel the spleen. A perfunctory examination while assuming the spleen is not going to be palpable is the best way to miss an enlarged spleen. The approach to this part of the physical examination should be to operate on the hypothesis that the spleen is enlarged and only be convinced that this is incorrect if your best attempts to confirm the hypothesis fail.

Each of the four physical examining techniques—inspection, auscultation, palpation, and percussion—is important in examining for splenic enlargement. The examiner should begin with observing the patient's abdomen on inspiration. In the extremely enlarged spleen, this can lead to observation of the splenic edge descending in the left upper or lower abdomen or, in the extreme case, in the right abdomen. If the spleen cannot be seen, the left upper quadrant should be auscultated during inspiration. Both the maneuvers of inspection and auscultation are most efficiently incorporated into the initial part of the entire abdominal examination. The left upper quadrant and left lower ribs anteriorly and laterally should be auscultated for evidence of a splenic rub (i.e., a coarse, scratching sound coincident with inspiration). A splenic rub should be especially sought in patients complaining of left upper quadrant pain or pain on top of the left shoulder that is associated with inspiration, and in patients with recent trauma to the left upper quadrant.

Palpation of the left upper quadrant for splenic enlargement can be performed in a variety of ways. Each examiner should use techniques with which he or she is comfortable and *always* perform them in exactly the same manner and order. A standard approach is the key to avoiding mistakes. Palpation for splenic enlargement should begin with the patient supine and with knees flexed. Using the right hand,

the examiner should begin well below the left costal margin and feel gently but firmly for the splenic edge by pushing down, then cephalad, then releasing (Figure 150.1). This maneuver should be repeated, working toward the left costal margin. If the spleen cannot be felt below the left costal margin with the patient breathing quietly, the left hand should be placed behind the left lateral ribs and the right just below the left costal margin (Figure 150.2). The patient, on instruction from the examiner, should inspire deeply. The examiner's right hand should then repeat the maneuver of pressing down, cephalad, and releasing. This should be performed with the right hand at the mid-left costal margin and more laterally until the examiner finds the spleen or is convinced that he or she cannot feel the splenic edge. The splenic edge is frequently "sharp," but can feel "rounded." If the spleen still has not been felt, the patient should be placed in the right lateral position and approached in one of two ways (see Figures 150.3 and 150.4), depending on which is preferred by the examiner. In either case, once the examiner is in position, the same hand movements should be repeated while the patient inspires deeply. It should be noted that when this maneuver is performed with the examiner standing behind the patient, the fingers are "hooked" over the costal margin.

If all these maneuvers fail to demonstrate splenic enlargement, it is appropriate to use percussion as a final step. In both the supine and right lateral positions, the left upper quadrant immediately below the costal margin and the left



Figure 150.1

By palpating only the splenic edge at the right costal margin, it is possible to miss an extremely enlarged spleen by never feeling low enough to feel the edge. Palpation of the spleen should begin well below the left costal margin using the hand movements described in the text.

**Figure 150.2**

This is the classic position for splenic palpation. As the patient inspires, the edge of an enlarged spleen descends to the examiner's fingertips.

**Figure 150.4**

Some examiners feel more comfortable examining for the spleen from behind the patient, in the right lateral position. In this case, the fingers are "hooked" over the costal margin.

lower rib margin should be percussed on inspiration and expiration. Dullness that is not present during expiration but is present during inspiration should suggest the presence of an enlarged spleen that has descended with inspiration. In this case, palpation should be repeated to try to confirm this impression.

All these maneuvers can be done in a few minutes when the examiner is confident in his or her technique. When a left upper quadrant mass is found, it is important to consider that it might not be the spleen. The most frequent organ to be confused with an enlarged spleen is an enlarged left kidney. The position in the abdomen, characteristics of the palpated "edge," and movement on inspiration are usually sufficient to identify with confidence an enlarged spleen.

**Figure 150.3**

With the patient in the right lateral position, minimal splenic enlargement can be detected by examining either from in front or in back of the patient. In the position illustrated here, the examination is performed much as in Figure 150.2.

If any question exists, however, it can be resolved by an abdominal ultrasound examination.

Basic Science

The normal adult spleen contributes to the homeostasis of the body by removing from the blood useless or potentially injurious materials (e.g., abnormal or "wornout" red blood cells and microorganisms) and by synthesizing immunoglobulins and properdin. Splenic enlargement can be associated with decreased or increased function, depending on the cause of the enlarged spleen. The causes of splenic enlargement include vascular congestion (e.g., portal hypertension secondary to cirrhosis or splenic vein thrombosis), reticuloendothelial hyperplasia (e.g., systemic infections such as typhoid fever and endocarditis), "work hypertrophy" (e.g., certain hemolytic anemias), and infiltrative processes (e.g., tumor, extramedullary hematopoiesis, amyloidosis). When splenic enlargement is associated with a change in splenic function, it is most frequently associated with splenic hyperfunction. This is reflected in the peripheral blood by thrombocytopenia, leukopenia, rapid red blood cell destruction, or a combination of these findings. This clinical syndrome of an enlarged spleen and peripheral cytopenias is often referred to as *hypersplenism*. When splenic enlargement is secondary to an infiltrative process (i.e., tumors or amyloidosis), splenic hypofunction can result. This is reflected in the peripheral blood by Howell-Jolly bodies and abnormal red blood cell forms. The presence of an enlarged spleen should lead to examination of the peripheral blood by the physician.

Clinical Significance

The presence of an enlarged spleen can frequently be the clue that puts the other physical findings in perspective and leads to the correct diagnosis. Splenic enlargement is a finding that should never be ignored. The differential diagnosis

Table 150.1
Causes of Splenomegaly

Vascular congestion

Cirrhosis
Splenic vein thrombosis
Portal vein thrombosis

Reticuloendothelial hyperplasia

Acute infections (e.g., typhoid fever, cytomegalovirus, Epstein-Barr virus infection)
Subacute or chronic infections (e.g., bacterial endocarditis, brucellosis, tuberculosis, histoplasmosis, malaria)
Collagen-vascular diseases and abnormal immune responses (e.g., systemic lupus erythematosus, serum sickness, sarcoidosis)

Work hypertrophy

Hemolytic anemias (e.g., spherocytosis)

Infiltrative or replacement processes

Nonmalignant hematologic disorders (e.g., polycythemia vera, myelofibrosis)
Leukemias
Lymphomas
Metastatic solid tumors
Storage diseases (e.g., Gaucher's disease)
Amyloidosis
Benign tumor and cysts
Abscess
Subcapsular hemorrhage

is extensive. Table 150.1 gives one approach to categorizing the causes of splenic enlargement. It is extremely important to correlate the presence of an enlarged spleen with the historical findings, other physical findings, laboratory results, and x-ray findings to identify the cause of splenic enlargement in a particular patient. For example, vascular spiders, red palms, and small testes in a patient with splenic enlargement would strongly suggest liver disease as the etiology. Roth spots and a new heart murmur would suggest endocarditis. Extensive lymphadenopathy, weight loss, night sweats, and an enlarged spleen would suggest a malignant lymphoproliferative disease. By making these correlations, it is possible to utilize the presence of an enlarged spleen to plan a patient's subsequent evaluation and quickly and efficiently reach the correct diagnosis.

References

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